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## Clearing peripheral equipment faults

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### Symptoms:

|                                                            |     |
|------------------------------------------------------------|-----|
| Red LED lit on Fibre Peripheral Controller card . . . . .  | 122 |
| Red LED lit on Remote Carrier Interface card . . . . .     | 124 |
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| Disabled peripheral equipment card . . . . .               | 130 |
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## Peripheral equipment faults

Peripheral equipment (PE) provides the interface between network equipment switching and terminal equipment (such as trunks, telephones, data sets, and attendant consoles). Peripheral equipment faults can disable network and terminal equipment.

**Note:** For fault clearing purposes, the general term “peripheral equipment” includes intelligent peripheral equipment (IPE). When there are differences, PE and IPE are specified.

### CAUTION

NT6D71 fuse replacement F1 through F16.

For continued protection against risk of fire, replace the fuse only with a fuse of the same type and rating (125 V, 1.0 A).

## Fault clearing procedures

Manual continuity tests can be used to isolate superloop network card and IPE faults. For a description of manual continuity tests, see *Meridian 1 general maintenance information* (553-3001-500). See “LD45” in the *X11 system messages guide* for details on performing the tests.

**Table 11** lists common peripheral equipment fault indications (many other system messages may be generated). To clear faults, select the symptom that most resembles the fault indications and go through the procedure for clearing each possible cause until the fault is fixed. Once the fault is corrected, disregard the remaining possible causes.

**Note:** Clear any power or common equipment faults before you try to clear telephone faults.

If the fault is not cleared after you have gone through each possible cause, check the most recent fault indications. Also check “How to clear faults” on page 3 to see if another type of fault is indicated.

After the fault is corrected, go to “Final maintenance procedure” on page 177 to completely restore normal operation.

**Table 11**  
**Peripheral equipment fault indicators**

| Indicator              | Possible indications                                                                                                                                |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Sample system messages | BSD301, 401, 402<br>ERR4062<br>NWS301, 401, 501<br>OVD001–010, 024<br>XMI messages                                                                  |
| Visual indicators      | Red LEDs lit on cards                                                                                                                               |
| Maintenance displays   | NT8D01BC, NT8D01AC, or NT8D01AD<br>Controller Card                                                                                                  |
| User reports           | Trouble with calls on attendant console<br>Trouble with calls on 500/2500 telephones<br>Trouble with calls on SL-1, M1000, or digital<br>telephones |

**WARNING**

Module covers are *not* hinged; do *not* let go of the cover. Lift the cover away from the module and set it out of your work area.

**Symptom:**  
**Red LED lit on Fibre Peripheral Controller card**

The red LED is lit on the controller card. Red LEDs on Peripheral (PE) Equipment cards on the same shelf may be lit. Look up all system messages and maintenance display codes in the *X11 system messages guide* and follow the instructions given. If the fault does not clear, use this procedure.

Manual continuity tests can be used to isolate IPE faults. See “LD45” in the *X11 input/output guide* for details on performing loopback tests.

**Note:** Continually observe and look up system messages as you perform this procedure.

Replace equipment as described in *Meridian 1 hardware replacement* (553-3001-520). You may need to replace one of the following:

- Fibre Peripheral Controller card: NT1P62
- IPE card
- IPE card cage: NT8D3703

| Possible cause                             | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Defective fibre peripheral controller card | Perform the fibre controller card self-test by executing the <b>DSXP x</b> command for LD 32 to disable the card.<br>Execute the <b>XPCT x</b> command to initiate self-test. <ul style="list-style-type: none"> <li>— The maintenance display on the card shows the code for each test running (see “HEX” in the <i>X11 input/output guide</i>).</li> <li>— If the tests complete successfully, the display continuously flashes.</li> <li>— If the card continually fails a test, the code for that test is steadily displayed.</li> </ul> If the test fails, replace the card.<br>If the test passes but the card is still disabled, enable the card:<br><b>ENXP x</b> “x” represents the controller number.<br>If the test fails, go to the next possible cause. |

(continued)

| Possible cause      | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Defective PE card   | <p>Unseat all the cards in the shelf associated with the controller card:</p> <ul style="list-style-type: none"><li>— If the red LED on the controller card turns off, the fault is in one of the unseated cards.</li><li>— Reinsert the cards one at a time.</li><li>— When the controller card LED turns on again, replace the last card you inserted.</li></ul> <p>If the red LED on the controller card does not turn off when the PE cards are unseated, reinstall the cards and go to the next possible cause.</p> |
| Defective cable     | <p>Test all cables to the controller card.</p> <p>If you find a defective cable, replace it.</p> <p>If there is no problem with the cables, go to the next possible cause.</p>                                                                                                                                                                                                                                                                                                                                           |
| Defective backplane | <p>Replace the card cage assembly in the module.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

**Symptom:**  
**Red LED lit on Remote Carrier Interface card**

**T**he red LED is lit on only one controller card. Red LEDs on Peripheral (PE) Equipment cards on the same shelf may be lit. Look up all system messages and maintenance display codes in the *X11 system messages guide* and follow the instructions given. If the fault does not clear, use this procedure.

Manual continuity tests can be used to isolate IPE faults. See “LD45” in the *X11 input/output guide* for details on performing the tests.

**Note:** Continually observe and look up system messages as you perform this procedure.

Replace equipment as described in *Meridian 1 hardware replacement* (553-3001-520). You may need to replace one of the following:

- Remote Carrier Interface card: NT7R52
- IPE card
- IPE card cage: NT8D3703

| Possible cause                          | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Defective Remote Carrier Interface card | <p>Perform the remote carrier interface card self-test by removing and reinstalling the card.</p> <p>Observe the self-test:</p> <ul style="list-style-type: none"> <li>— The maintenance display on the card shows the code for each test running (see “HEX” in the <i>X11 input/output guide</i>).</li> <li>— If the tests complete successfully, the display continuously flashes.</li> <li>— If the card continually fails a test, the code for that test is steadily displayed.</li> </ul> <p>If the test fails, replace the card.</p> <p>If the test passes but the card is still disabled, enable the card:</p> <p><b>ENLL sl</b>            “sl” represents the card number.</p> <p>If the test fails, go to the next possible cause.</p> |

(continued)

| Possible cause      | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Defective PE card   | <p>Unseat all the cards in the shelf associated with the controller card:</p> <ul style="list-style-type: none"><li>— If the red LED on the controller card turns off, the fault is in one of the unseated cards.</li><li>— Reinsert the cards one at a time.</li><li>— When the controller card LED turns on again, replace the last card you inserted.</li></ul> <p>If the red LED on the controller card does not turn off when the PE cards are unseated, reinstall the cards and go to the next possible cause.</p> |
| Defective cable     | <p>Test all cables to the controller card.</p> <p>If you find a defective cable, replace it.</p> <p>If there is no problem with the cables, go to the next possible cause.</p>                                                                                                                                                                                                                                                                                                                                           |
| Defective backplane | <p>Replace the card cage assembly in the module.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

**Symptom:**  
**Red LED lit on Peripheral Controller card**

The red LED is lit on only one controller card. Red LEDs on Peripheral (PE) Equipment cards on the same shelf may be lit. Look up all system messages and maintenance display codes in the *X11 system messages guide* and follow the instructions given. If the fault does not clear, use this procedure.

Manual continuity tests can be used to isolate IPE faults. See “LD45” in the *X11 input/output guide* for details on performing the tests.

**Note:** Continually observe and look up system messages as you perform this procedure.

Replace equipment as described in *Meridian 1 hardware replacement* (553-3001-520). You may need to replace one of the following:

- Controller card: NT8D01BC, NT8D01AC, NT8D01AD
- IPE card
- IPE card cage: NT8D3703

| Possible cause            | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Defective controller card | Remove, then, reinstall the controller card to initiate a self-test: <ul style="list-style-type: none"> <li>— The maintenance display on the card shows the code for each test running (see “HEX” in the <i>X11 input/output guide</i>).</li> <li>— If the tests complete successfully, the display continuously flashes.</li> <li>— If the card continually fails a test, the code for that test is steadily displayed.</li> </ul> If the test fails, replace the card.<br>If the test passes but the card is still disabled, test the loop by entering:<br><b>LD 30</b><br><b>LOOP loop</b> “loop” represents the loop number.<br>If the test fails, go to the next possible cause.<br><div>(continued)</div> |



| Possible cause      | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Defective PE card   | <p>Unseat all the cards in the shelf associated with the controller card:</p> <ul style="list-style-type: none"><li>— If the red LED on the controller card turns off, the fault is in one of the unseated cards.</li><li>— Reinsert the cards one at a time.</li><li>— When the controller card LED turns on again, replace the last card you inserted.</li></ul> <p>If the red LED on the controller card does not turn off when the PE cards are unseated, reinstall the cards and go to the next possible cause.</p> |
| Defective cable     | <p>Test all cables to the controller card.</p> <p>If you find a defective cable, replace it.</p> <p>If there is no problem with the cables, go to the next possible cause.</p>                                                                                                                                                                                                                                                                                                                                           |
| Defective backplane | <p>Replace the card cage assembly in the module.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

**Symptom:**  
**Red LED lit on dual loop peripheral buffer card**

The red LED is lit on only one dual loop peripheral buffer card. Red LEDs on PE cards on the same shelf may be lit. Look up all system messages and maintenance display codes in the *X11 system messages guide* and follow the instructions given. If the fault does not clear, use this procedure.

*Note:* Continually observe and look up system messages as you perform this procedure.

For information on switch settings, see *Circuit card installation and testing* (553-3001-211). Replace equipment as described in *Meridian 1 hardware replacement* (553-3001-520). You may need to replace one of the following:

- Dual loop peripheral buffer (DLB) card: QPC659 or NT5K10
- Existing Peripheral Equipment Power Supply (EPEPS): NT5K12
- Cable between the Network Superloop card and the Enhanced Dual Loop Peripheral Buffer Card
- PE card
- PE card cage NT8D1303 or NT5K1106

| Possible cause             | Action                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Defective QPC659M DLB card | Test the shelf by entering:<br><b>LD 30</b><br><b>LOOP I s</b> "I s" represents loop and shelf numbers.<br><i>Note:</i> If two loops are assigned to the shelf, be sure to test both.<br>If a defective DLB card is indicated, check the switch settings on the card. If the switch settings are correct, replace the card.<br>If the test fails but the DLB card does not seem to be faulty, go to the next possible cause. |

(continued)

| Possible cause            | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Defective NT5K10 DLB card | <p>In Dual Loop Mode</p> <ul style="list-style-type: none"><li>— Unseat 4 PE cards pertaining to the defective loop or</li></ul> <p>In Single Loop Mode</p> <ul style="list-style-type: none"><li>— Unseat 8 PE cards pertaining to the defective loop.</li></ul> <p>Wait for the OVD message.</p> <p>If there is no OVD message, go to the defective PE card.</p> <p>If you receive an OVD message, remove the backplane access plate at the rear of the EEPE shelf and replace the Dual Loop Peripheral Buffer Card.</p> <p>Reinsert the PE cards on the shelf.</p> <p>Replace the backplane access plate.</p>                                                              |
| Defective PE card         | <p>For the EEPE shelf only: remove the backplane access plate at the rear of the module.</p> <p>Unseat all the cards in the shelf associated with the DLB card:</p> <ul style="list-style-type: none"><li>— If the red LED on the DLB card turns off, the fault is in one of the unseated cards.</li><li>— Reinsert the cards one at a time.</li><li>— When the DLB LED turns on again, replace the last card you inserted.</li></ul> <p>If the red LED on the DLB does not turn off when the PE cards are unseated, reinstall the cards and go to the next possible cause.</p> <p>For the EEPE shelf only: replace the backplane access plate at the rear of the module.</p> |
| Defective cable           | <p>Test all cables to the DLB card.</p> <p>If you find a defective cable, replace it.</p> <p>If there is no problem with the cables, go to the next possible cause.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Defective backplane       | <p>Replace the card cage assembly in the module.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

**Symptom:**  
**Disabled peripheral equipment card**

One PE or IPE card is disabled, the red LED on a PE card is lit, or two or more units on a card are disabled. There is a system message indicating that the card or units on the card are disabled. Only one card on the shelf is affected. Look up all system messages and maintenance display codes in the *X11 system messages guide* and follow the instructions given. If the fault does not clear, use this procedure.

Manual continuity tests can be used to isolate IPE faults. See “LD45” in the *X11 input/output guide* for details on performing the tests.

**Note:** Continually observe and look up system messages as you perform this procedure.

Replace equipment as described in *Meridian 1 hardware replacement* (553-3001-520). You may need to replace one of the following:

- Controller card: NT8D01BC, NT8D01AC, NT8D01AD
- Dual loop peripheral buffer (DLB) card: QPC659 or NT5K10
- Superloop network card and network card: NT8D04, QPC414
- PE or IPE card
- PE or IPE card cage: NT8D1303, NT8D3703

| Possible cause    | Action                                                                                                                                                                                                                                                           |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Defective PE card | Replace the affected card.<br><br>Enable the card by entering:<br><br><b>LD 32</b><br><b>ENLC I s c</b> “I s c” represents loop, shelf, and card numbers.<br><br>Test the card by entering:<br><br><b>LD 30</b><br><b>SHLF I s</b><br><br><div>(continued)</div> |

| Possible cause                        | Action                                                                                                                                                                            |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Defective controller card or DLB card | Replace the controller card or DLB card.<br>Enable the PE card by entering:<br><b>LD 32</b><br><b>ENLC I s c</b><br>Test the card by entering:<br><b>LD 30</b><br><b>SHLF I s</b> |
| Defective network card                | Replace the network card.<br>Test the loop by entering:<br><b>LOOP loop</b> “loop” represents the loop number.                                                                    |
| Defective backplane                   | Replace the card cage assembly in the module.                                                                                                                                     |

**Symptom:**  
**More than one peripheral equipment card disabled**

More than one PE or IPE card, or two or more units on different cards, are disabled on the same shelf. There is a system message indicating that the cards or units on the cards are disabled. Look up all system messages and maintenance display codes in the *X11 system messages guide* and follow the instructions given. If the fault does not clear, use this procedure.

Manual continuity tests can be used to isolate IPE faults. See “LD45” in the *X11 input/output guide* for details on performing the tests.

**Note:** Continually observe and look up system messages as you perform this procedure.

Replace equipment as described in *Meridian 1 hardware replacement* (553-3001-520). You may need to replace one of the following:

- Cable between network card and PE/IPE shelf
- Controller card: NT8D01BC, NT8D01AC, NT8D01AD
- Dual loop peripheral buffer (DLB) card: QPC659 or NT5K10
- Superloop network card and network card: NT8D04, QPC414
- PE or IPE card
- PE or IPE card cage: NT8D1303, NT8D3703

| Possible cause                        | Action                                                                                                                                                                                                                              |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Defective controller card or DLB card | Replace the controller card or DLB card.<br>Enable the PE card by entering:<br><b>LD 32</b><br><b>ENLC I s c</b> “I s c” represents loop, shelf, and card numbers.<br>Test the card by entering:<br><b>LD 30</b><br><b>SHLF I s</b> |

(continued)

| Possible cause                    | Action                                                                                                                                                                                                                    |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Defective cable from network card | Disable the loop for the affected shelf by entering:<br><b>DISL loop</b> "loop" represents the loop number.<br>Replace the cable from the network card to the PE shelf.<br>Test the loop by entering:<br><b>LOOP loop</b> |
| Defective network card            | Replace the network card.<br>Test the loop by entering:<br><b>LOOP loop</b>                                                                                                                                               |
| Defective PE card                 | Replace the affected card.<br>Enable the card by entering:<br><b>LD 32</b><br><b>ENLC I s c</b><br>Test the card by entering:<br><b>LD 30</b><br><b>SHLF I s</b>                                                          |
| Defective backplane               | Replace the card cage assembly in the module.                                                                                                                                                                             |